

ART. XI. THE OCCURRENCE OF THE EASTERN TIGER
SALAMANDER, *AMBYSTOMA TIGRINUM TIGRINUM*
(GREEN), IN PENNSYLVANIA AND NEAR-BY STATES

BY M. GRAHAM NETTING*

Several years ago the late Dr. D. A. Atkinson donated to the Carnegie Museum two large collections of amphibians and reptiles which he had secured in Western Pennsylvania between 1899 and 1912. Since many of the local streams were not polluted at that time, a number of species, now rare locally, are represented by excellent series of specimens. However, the most surprising find in the collections was a series of four specimens of *Ambystoma tigrinum tigrinum* (Green) collected at Wexford, McCandless Township, Allegheny County, Pennsylvania, on April 1, 1911, by Dr. Atkinson. These specimens constitute the first adults of the species ever collected in Pennsylvania, and they add a third locality for the species in the state.

The series consists of one adult male, CM 10431, which is 230 mm. in total length; two adult females, CM 10432-33, measuring 225 and 190 mm. respectively; and a subadult female, CM 10434, approximately 150 mm. in length. Six specimens of *Ambystoma jeffersonianum*, CM 10435-40, were taken at the same locality on the same date, and one specimen of *Ambystoma maculatum*, CM 10527, was secured at Wexford by Dr. Atkinson on March 31, 1908. Wexford is situated in the northern part of Allegheny County in the Pittsburgh Section of the Appalachian Plateaus Province. It lies in unglaciated territory, in a region of low hills; the highest point in the vicinity having an altitude of 1298 feet and the stream valleys an altitude of approximately 1100 feet. According to Dr. Atkinson's recollection, the specimens were taken in a small pond which was then surrounded by forest.

It is doubtful if *tigrinum* was ever widely distributed in southwestern Pennsylvania where suitable habitats for this species are not well represented. *A. maculatum*, on the other hand, is by no means

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rare even today, and was probably far more widespread when the area was forested. The reduction in the *maculatum* population may be attributed, in a large measure, to deforestation, but I wish to call attention to another factor which certainly affected the latter species, and possibly the former as well. During the latter decades of the nineteenth century and the early years of the twentieth, Pittsburgh boasted a very active Entomological Society. As early as 1888, Mr. Samuel Klages, an ardent coleopterist, discovered that *Ambystoma maculatum* fed upon three species of beetles of the genus *Cychrus*, now known as *Scaphinotus viduus* (Dejean), *Scaphinotus germari* Chaudoir, and *Sphaeroderus lecontei* Dejean. Since these species were not common in collections and were highly desirable for exchange purposes, Mr. Klages, and some of his fellow members, embarked upon a salamander extermination campaign which was eminently successful so far as beetle collecting in succeeding years was concerned. How long this killing of *Ambystomas* was continued, or how widespread the practice became in this region, it is now impossible to ascertain, but Mr. Klages alone is said to have killed as many as one hundred of the "yellow spotted" salamanders in a single day. It is doubtful if this attempted extermination was selective enough to stop with *maculatum*. If, as I assume, *tigrinum* was always rare and local in its distribution in the Pittsburgh area, this systematic killing may have led to its extermination at some of its stations.

Cope secured a salamander from Londongrove, Chester Co., Pa., which he considered a nondescript and which he described (1859: 123) as *Ambystoma conspersum*. This specimen, no. 10589 in the collection of the Academy of Natural Sciences of Philadelphia, and certain others from Carlisle, Pa., which have been considered conspecific with it, have complicated herpetological literature for years. Since *conspersum* has proved to be invalid, and later, expanded descriptions are unquestionably composite, it is necessary to review the principal references in order to allocate the Pennsylvania specimens, which have been recorded under this name, to their proper synonymies.

Cope (1867: 177-178) listed the ANS type, and four additional specimens; *i.e.* USNM 3934 (3) and USNM 3918 (1) collected at Carlisle, Cumberland Co., Pa., by Prof. S. F. Baird. Cope (1875: 25) gave the range of *conspersum* as "Pennsylvania to Georgia," but did not mention any specimens. Boulenger (1882: 42) listed several larvae

from Carlisle presented by the Smithsonian Institution. Next Yarrow (1883: 148) listed USNM 7904 (30 larvae—probably a misprint of 300) also taken at Carlisle by Baird. However, Cope (1889: 61-62) again listed ANS 10589 and USNM 3918 and 3934 (the last appearing under both *conspersum* and *punctatum*!), but he failed to list the specimens cited by Yarrow. Dr. Cochran wrote to me, under date of Feb. 5, 1936: "Our U.S.N.M. 3918 is listed in the original record book as *Salamandra*, Carlisle, Pa., S. F. Baird, 1 specimen. We do not have it now, and there are no cards for it, so it evidently disappeared or was destroyed long before our present card-catalogue system was inaugurated." Since this specimen came from the same locality and same collector as USNM 3934, and since Cope twice listed it as being conspecific with the latter, it appears probable that the two numbers represented the same species, and that USNM 3918 may be subjected to the same taxonomic fate as USNM 3934. Stone (1906: 160), Fowler and Dunn (1917: 10), and Stejneger and Barbour (1917: 9), refer only to the type specimen or type locality.

Dr. E. R. Dunn has examined the existing specimens on which the above records are based. The type of *conspersum* proved to be a recently transformed individual of *tigrinum*. However, USNM 3934 (4 specimens were listed in the original record but there are now 3 young and 4 larvae in the jar) and USNM 7904 (the number of specimens is not stated in the record book but there are now 319 soft *Ambystoma* larvae and two specimens of *Desmognathus fuscus fuscus* in the jar) proved to be *opacum*. Therefore, it appears that all of the USNM specimens from Carlisle formerly referred to *conspersum* are actually larvae of *opacum*, and that all published records of *conspersum* at this locality should be referred to the synonymy of *opacum*.

Surface (1913: 50-51) included *tigrinum* in the herpetofauna of Pennsylvania on the basis of its range, but stated that his collection did not include any specimens from the state. Stewart (1926: 4) followed Surface in listing the species in the absence of specimens. Mohr (1930: 50) wrote as follows: "Professor E. R. Dunn, of Haverford College, supplied the following records of this rare salamander: one adult and two larvae collected at Carlisle by Baird, and now in the National Museum; an adult from Londonville, Chester County, now in the American Museum of Natural History, and a larva in the same museum from Pittsburgh. He also has a record of an adult from

Mountainville, Lehigh County." This statement contains a number of errors. There is no adult from Londonville, Chester County, in the American Museum collection and this is presumably a confused reference to the Academy type of *conspersum* from Londongrove. The record of an adult from Mountainville is apparently a bibliographic error since Mattern and Mattern, the only writers who have published *Ambystoma* records for Mountainville, list only *jeffersonianum* and *maculatum* in their Lehigh County list. The AMNH larva referred to by Mohr was collected by Maximillian, presumably in 1832. When Dunn examined this specimen some years ago, he determined it as a larva of *tigrinum*. Since the determination was open to question because the specimen was in a very poor state of preservation, and in the absence of other specimens from Western Pennsylvania, I have consistently omitted this record in several published lists of the local fauna. Dr. Noble informs me that the Maximillian specimen is now in such bad condition as to be absolutely unidentifiable. However, the adults secured by Dr. Atkinson increase the probability that Maximillian was the first collector to secure the species in Pennsylvania. Netting (1933: 102) states in reference to the species "it has been definitely recorded from Londongrove, Chester County, and there is, in addition, a questionable record for Cumberland County." As I have shown, the Carlisle, Cumberland County, records are referable to *opacum*.

Dr. Dunn spent a week at Londongrove in the spring of 1920 searching unsuccessfully for topotypes of *conspersum*. It is to be hoped that future collecting in the Wexford and Londongrove areas will yield additional specimens. All of the known specimens of *tigrinum* from Pennsylvania are listed below. The published records for the state are based on these specimens, on the general range of the species, or they refer to *opacum* as noted above.

PENNSYLVANIA SPECIMENS OF *TIGRINUM*

Allegheny County

AMNH 1846	1 larva	Pittsburgh	1832	Maximillian
CM 10431-34	4 adults	Wexford	Apr. 1, 1911	D. A. Atkinson

Chester County

ANS 10589	1 post-larva	Londongrove	(Type of <i>A. conspersum</i> Cope)	
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TIGRINUM RECORDS FOR NEAR-BY STATES

The following summary of the occurrence of *tigrinum* in states near Pennsylvania is believed to be accurate. I will be delighted to be informed of any existing specimens which I have overlooked. No attempt has been made to survey the literature for any of these states except West Virginia.

Delaware: No specimens are known from this state.

Maryland: The only known specimen is USNM 89904 which was collected at Vienna, Nanticoke River, Dorchester County. Dr. Cochran wrote to me, under date of May 12, 1936, that this specimen "was received in Feb. 1933 from a physician, Dr. E. E. Lamkin, who, as I recollect, said that there were lots of them near a water-works at Vienna."

New Jersey: The species is not rare on the coastal plain.

New York: In addition to numerous Long Island records there is one specimen from the mainland in the American Museum of Natural History collection. This specimen, no. 2327, was collected at Suffern in 1896 by W. A. Chapman.

Ohio: Dr. Charles M. Walker informs me that he has taken *tigrinum* in Ohio in only a few scattered localities in the western half of the state, but that there is a specimen from "Rockport" in the Museum of Comparative Zoology. Since there is a "Rock Port" in Allen County in western Ohio as well as a "Rockport" in Cuyahoga County in eastern Ohio the exact derivation of this specimen may be open to question. Mr. Arthur Loveridge writes, under date of Apr. 28, 1938: "I have searched our register and there does not appear to have been any other J. P. Kirtland material catalogued. The specimen MCZ 169, *Ambystoma tigrinum*, Rockport, Ohio, was sent to Baird for identification on 22.I.1859, and formed part of Prof. Agassiz's collection (catalogued by species when the catalogue was commenced) on 20.II.1862. There is no date of collection nor further information available in the register or with the specimen." Since Kirtland lived in Cuyahoga County and since the spelling of the locality is in agreement I believe that this specimen may be accepted as having come from Rockport (approx. $1\frac{1}{4}$ mi. S. of Rocky River), Cuyahoga County, and that it represents, therefore, the easternmost record for *tigrinum* in Ohio.

Virginia: There is one specimen, USNM 9273, from "Virginia," collected in Sept. 1874.

West Virginia: No specimens are known from West Virginia. Bond's (1931: 53) record of the species as "Not uncommon" in Monongalia County was based upon a single specimen in his private collection which I examined later and found to be *maculatum*. Strader's (1936: 33) sight record for an adult "seen near an egg mass on Shenandoah River near Bloomery on March 18, 1933—at night" almost certainly refers to *jeffersonianum*. Since some of the rarer West Virginia species are represented in the collections of West Virginia University by specimens which are without definite locality data, but which are most probably from the state, I examined the entire salamander collection at Morgantown. The only specimens of *tigrinum* in this collection were two collected at Fort Whipple, Arizona, in 1920 by A. F. Vierheller.

REMARKS ON DISTRIBUTION

The definite locality records mentioned in this paper number three for Pennsylvania, one for Maryland, one for mainland New York, and one for eastern Ohio. Six localities scattered over four states do not provide an adequate basis for any statements regarding distribution. It is worth noting, however, that the altitudinal range represented by these records varies from twelve feet at Vienna, Md., to 1100 feet at Wexford, Pa. Pittsburgh, Vienna, and Suffern are located in river valleys, Rockport on a bluff overlooking a river, and both Wexford and Londongrove in regions drained by numerous creeks. In spite of active herpetological collecting during recent decades, only the Wexford and Vienna specimens were collected subsequent to 1900. Probably *tigrinum* had attained the status of a relict form, in the area treated here, by the mid-nineteenth century. The trend toward disappearance has apparently continued since then, but whether river pollution or other man-engendered factors have contributed to this trend it is impossible to say. A detailed study of the ecology of *tigrinum* on Long Island and the New Jersey Coastal Plain offers the only approach to an explanation of the erratic distribution of the form in the several near-by states.

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